

This lesson is part of a larger, comprehensive school garden guide called **Minnesota School Gardens: A Guide to Gardening and Plant Science** developed by Minnesota Agriculture in the Classroom in 2013. The entire guide is available at www.mda.state.mn.us/maitc.



Grade

Elementary 3-5

Materials/Preparation

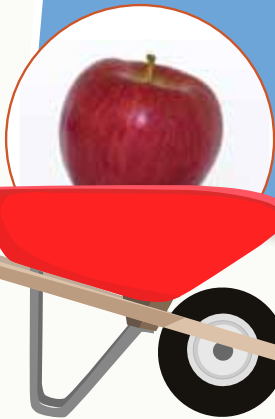
- ☐ Handout A – Plant Dimensions Chart – one per student
- ☐ Handout B – Plan It, Map It – one per student
- ☐ Seed catalogs or Internet access to seed catalogs
- ☐ Rulers, yardsticks, measuring tapes
- ☐ Paper, graph paper or notebook (or purchase garden planning software to use computers)
- ☐ Writing instruments

optional

- ☐ Calculators

Fun Fact

Apple trees take four to five years to produce their first fruit.



Plan It, Map It

Minnesota K-12 Academic Standards

Math	3.3.2	Understand perimeter as a measurable attribute of real world and mathematical objects. Use various tools to measure distances.
Math	4.3.2	Understand angle and area as measurable attributes of real world and mathematical objects. Use various tools to measure angles and areas.
Math	5.2.3	Understand and interpret equations and inequalities involving variables and whole numbers, and use them to represent and solve real-world and mathematical problems.
Science	3.4.1.1 5.4.1.1	Living things are diverse with many different characteristics that enable them to grow, reproduce and survive.
Science	5.4.2.1	Natural systems have many parts that interact to maintain the living system.

Summary/Overview

Using the information provided, students use math skills to plan their garden.

Garden Connection

Students learn about plant varieties, row width, space between plants, and height.

Background Information

Living things compete with one another to survive and reproduce. Plants have differing characteristics unique to their species and variety. Even within species there are differences between varieties. Consider the number of different squashes, or the variety of tomato plants. Much of the information in this guide sets standard parameters that plants need. But this can vary. This activity gives students the opportunity to experience first-hand that math has a purpose with real-life applications, research various plant information, and make decisions about the garden they will plan and plant.

Objectives

- List plant-growing requirements to consider when planning a garden.
- Use simple multiplication to calculate garden rows and size.

Procedure

Interest Approach

Have students brainstorm their favorite vegetables. Create a list on the board.

Summary of Content and Teaching Strategies

Groundwork: Spacing Requirements

Have students select vegetable plants they could plant in the garden. Make a list of those plants. Students may refer to the list of favorite vegetables from the Interest Approach above.

Using hard copy seed catalogs or online seed suppliers, ask students to identify the number of varieties of one of these vegetables. Students can work in small groups to find the information on their chosen or assigned vegetable. Provide students with copies of Handout A. They list the names of the varieties available on Handout A. Burpee Seeds online is a good resource for finding this information.

NOTE: For plants with more than 10 varieties, have students select a specific type of that vegetable (i.e. tomatoes: select full-sized, slicing tomatoes or heirloom; squash: select winter squash or summer squash; peppers: select sweet bell peppers or hot peppers).

Ask students to identify each variety's growing requirements and note them in the chart provided. Have them select the variety they think is best to plant in the school garden and estimate the number of plants they would like to have.

Next have students calculate the number of square feet their garden will require to grow the number of vegetables they have selected. Students then create a rough-draft map of their garden drawn to approximate scale. The teacher should set the specific scale for the class and determine if the garden will be planted using rows or square foot gardening.

Groups take turns sharing the information on their specific vegetable with the rest of the class.

Exploration

Designing the School Garden

Give students the actual school garden dimensions. Share what garden space will be available for their class to use.

Have students determine what and how many of each plant they will incorporate into the garden. Decisions to be made:

1. Will each student have his or her own plant or plants (number)?
2. Will each student have the same type of plant?
3. If so, what will it be? If not, how many total types of vegetables will be grown?
4. Will more than one variety of each vegetable be grown?



As a group, plan the school garden. Consider plant height in relation to the sun to prevent tall plants from shading short plants. Also plan room for humans to weed, water, and harvest the garden.

Instruct students to make a scale drawing of the garden plot. For younger students, plant needs can be depicted graphically by making a paper pattern of the space needed by each plant. Use these patterns to map out the garden in scale size.

Review/Summary

Have students answer the following questions in small groups:

1. Name three vegetables that can be grown in a garden.
2. Explain why it is important to leave room between plants.
3. Describe why plant height needs to be considered when planning a garden.

Modifications/Extensions

- Have students create algebraic equations for planning the garden.
- Have students create gardens that incorporate circles, triangles, rectangles, octagons, and create a garden diagram drawn to scale that provides adequate plant space and human working space.
- Have students create three-dimensional gardens that use fencing, wire cages, climbing poles, etc. to make use of vertical as well as horizontal space.



*"Children are born naturalists.
They explore the world with
all of their senses, experiment
in the environment, and
communicate their discoveries
to those around them."*

The Audubon Nature Preschool

Sources/Credits

The above lesson is provided courtesy of Florida Agriculture in the Classroom, Inc. from its *Gardening for Grades* school garden curriculum.

Name _____



Plant Dimensions Chart

Vegetable Selected			
Variety	Row Width	Space Between Plants	Height

Name _____



Plan It, Map It

1. Name three plants you would like to grow.

2. Select one of those plants and list it below.

Does this plant have any special needs?

3. How much distance should there be between this plant and the next plant in the same row?

4. If this plant were planted in several rows, how far apart should each of these rows be from the next row?

5. How tall does this plant grow?
